

In the Specification:

On page 6, please amend the paragraph starting on line 1 to read:

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In its simplest form, a tire 40 for the roller includes the compliant core 44 surrounding the shaft 20, and the layer of non-compliant material 48 surrounding the compliant core. Although not required, a hub can be located intermediate the compliant core and the shaft. The hub can be a relatively rigid sleeve and formed of a variety of materials including, but not limited to metal, plastic or composites. The hub can be used to reduce the amount of compliant material necessary to fill the annular space between the shaft 30 and the non-compliant layer 48.

On page 6, please amend the paragraph starting on line 13 to read:

~~A tire 40 that deforms significantly at the nip is referred to as a compliant tire, whereas a hard tire, which does not deform significantly at the nip, is understood to be non-compliant. As used herein, compliant means having a tendency to deform significantly in use, particularly in a roller assembly 10, while non-compliant means having a tendency to deform no more than insubstantially in use, particularly in a roller assembly. The compliant behavior can be understood by referring to Figure 2 and 3. Figure 2 depicts the tire 40 in the unloaded (concentric) state. Figure 3 depicts the tire 40 a loaded state in which the compliant core 44 is elastically deformed. While the sheet material 12 is not shown in Figure 3, it is clear that the contact between the tire 40 and the sheet material 12 must be at the lowest point of the drawing, since the non-compliant layer is offset upward. Figure 3 is a "snapshot" of the tire 40 in a single position of the loaded state. Clearly, as the tire 40 rotates, the compliant layer 44 will experience continual elastic deformation to accommodate the illustrated offset.~~

On page 6, please amend the paragraph extending from line 26 to read:

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It is understood the tendency of a material to exhibit the characteristics referred to herein as compliant or non-compliant depends on the structure and materials used for the other elements of the invention. That is, the relative hardness of

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the two materials used to construct a tire 40 in accordance with the invention will determine the extent to which each material deforms during use and therefore the extent to which each material is either compliant or non-compliant. If a very soft material is used for the core 44 of the tire 40, and that material has a tendency to deform easily in use, then a moderately hard material can be used for the non-compliant layer 48 without exhibiting any substantial deformation in ordinary use in a roller assembly in accordance with the invention. When a harder compliant core material, which resists deformation is used, a harder layer [of] non-compliant material can be used to substantially eliminate deformation. It will be appreciated that the relative hardness of the materials as well as the characteristics of the materials themselves determines whether the materials will be compliant or non-compliant as those terms are used herein. In addition to the absolute and relative hardness of the materials, the thickness of the compliant core 44 and non-compliant layer 48 also effect the extent to which deformation occurs during use. For example, a relatively thick compliant core 44 will deform more than a thinner compliant core made from the same material. Similarly, a thicker non-compliant outer layer 48 will deform less than a thinner non-compliant outer layer made from the same material.

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On page 7, please amend the paragraph starting on line 19 to read:

The non-compliant layer 48 is selected to exhibit a cross sectional profile in an unloaded state, wherein the profile is substantially precluded from changing during operation. That is, as the shafts 30 are biased, thereby urging opposing tires 40 against each other, while the compliant core is sequentially stretched and compressed upon operable loading the profile of the non-compliant layer 48 is unchanged in that it does not deform at the nip.

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On page 7, please amend the paragraph starting on line 25 to read:

An outer most surface 52 of the tire must also provide a sufficient coefficient of friction to effectively transport the sheet material 12. In applications where paper is transported, the non-compliant layer 48 is preferably a natural or synthetic elastomer such as rubber or a synthetic polymer. Preferably, the

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Candy

surface 52 of the non-compliant layer 48 has a durometer not greater than approximately 60 Shore A, so as to provide a suitable coefficient of friction relative to a sheet of paper. More preferably, the non-compliant layer 48 has a hardness between 35 and 60 Shore A.

On page 8, please amend the starting on line 5 to read:

In one embodiment, the non-compliant layer 48 is a relatively rigid metal or plastic tube. The tube can have a thickness of about .020 inches or greater. The outer surface 52 of the tube is preferably roughened or coated with a high coefficient of friction material. The coating should preferably be relatively thin compared with the radius of the compliant core 44. A thin coating having a thickness of about of .020 inches has been found effective. Additional layers of material can be applied to the outside of the non-compliant layer 48 to enhance the ability of the roller 40 to transport particular materials. For example, a relatively thin layer 52 of soft material such as a soft rubber maybe applied to the outside surface of an otherwise slippery non-compliant layer 48. Preferably, the soft rubber layer is sufficiently thin to preclude any deformation which introduces a significant change in the circumference or deformation of the tire 40 and hence tendency to produce scrub.

On page 8, please amend the paragraph starting on line 25 to read:

The tire 40 is mounted to the shaft 30 by affixing the compliant core 44 relative to the shaft, or hub if used. The non-compliant layer 48 is affixed relative to the compliant core 44. In the unloaded position, the shaft 30, the compliant core 44 and the non-compliant layer 48 are concentric.

On page 11, please amend the paragraph starting on line 6 to read:

A tire 40 in accordance with this invention was constructed having a compliant core 44 constructed from 4 lb/ft³ polyurethane foam glued to a hub. A .160" thick layer of synthetic elastomer having a durometer of 60 the Shore A was glued to the outside of the core.

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On page 11, please amend the paragraph starting on line 10 to read:

A test fixture was constructed as a 1" diameter x 12" long steel idler roller. A pair of tires 40 constructed as described were attached to a 12" long .375" diameter shaft 30 spaced from the 1" steel roller. The shaft 30 carrying the tires 40 was adjusted so that the tires bore against the 1" steel shaft and deflected .050". The tires were driven at 100 rpm for 120 hours and the foam and glue were then visually inspected. No damage or wear was observed to any of the parts.

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On page 11, please amend the paragraph starting on line 17 to read:

Example 2-Radial Torque and Compressed Nip Test

The idler roller was removed and a wood block was substituted. The wood block was arranged on the end of a lever arm to apply 12 oz. of force between the surface of the block and the surfaces of the tires. The tires 40 were rotated for 120 hours at 100 rpm and the tires were visually inspected. The glued interface between the compliant core 44 and the non-compliant outer layer 48 was not damaged. The outer surface of the non-compliant layer 48 showed a loss of .012" in radius due to wear caused by rubbing on the wood block.

In the Specification

The paragraph on page 6 extending from line 13 to line 25 has been amended to better explain the structure of the invention and, in particular, the emphasize that the compliant layer 40 is intended to experience continual elastic deformation. It is important to understand that mere compressibility is insufficient. A material may be compressible without being sufficiently elastic. In this case it could not continually accommodate the required offset shown in Figure 3.

The other changes to the specification were made to correct minor editorial mistakes.

In the Claims

In order to better define the invention, in all Claims that formerly referred to a compliant core, the term “elastically deformable” has been substituted for “compliant”.

The above amendments to the specification and claims introduce no new material, since they conform to material already disclosed in the drawings, particularly Figures 2 and 3, and in the specification, particularly the portion thereof extending from page 3, line 13 to page 4, line 4.